UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	MOBLEY, ET AL.	ART UNIT:	2611
APPL. NO.:	09/840,767	EXAMINER:	BROWN, RUEBEN M
FILED:	APRIL 23, 2001	DOCKET NO.:	A-7195
TITLE:	BURST-MODE DIGITAL TRANSMITTER		

February 21, 2006

AMENDMENT AND RESPONSE

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 CFR 1.114, a Request for Continued Examination is filed concurrently with this response to the Final Office Action. Reconsideration and reexamination of the application and presently pending claims, as amended, are respectfully requested at this time.

Kindly amend the subject patent application as follows:

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A communications system for transmitting forward and reverse signals, the communications system comprising: ~~A transmitter for transmitting reverse optical signals in a broadband communications system, the transmitter comprising:~~

a plurality of terminals for providing reverse optical signals, wherein the reverse optical signals are transmitted in an analog format;

a reverse transmitter for receiving the reverse optical signals into a single input port and for providing a combined reverse optical signal in a digital format, the reverse transmitter comprising:

~~an input port for receiving analog RF signals from downstream;~~

a converter for converting the reverse optical signals into the digital format ~~digitizing the analog RF signals~~;

a carrier-detect circuit coupled to the converter for detecting the presence of each reverse optical signal received; ~~the converted digital RF signals and for allowing the converted digital RF signals to be provided to an output of the transmitter and transmitted upstream~~

a delay circuit coupled to the converter for delaying the reverse optical signals ~~digital RF signals~~; and

a switch coupled to the delay circuit and controlled by the carrier-detect circuit,

wherein the reverse transmitter provides the combined reverse optical signal in a single wavelength only in the presence of a detected reverse optical signal. ~~wherein the carrier-detect circuit closes the switch enabling a path for the transmission of the digital RF signals,~~

~~whereby signals are provided upstream only in the event of the presence of the detected digital RF signals.~~

2. (Canceled)

3. (Currently Amended) The ~~transmitter of claim 1, wherein the broadband~~ communications system of claim 1 further comprising: ~~includes:~~

a plurality of reverse transmitters;

a digital network coupled to each of the plurality of reverse transmitters for receiving and combining the combined reverse optical signal received from each reverse transmitter ~~the digital RF signals~~;

a receiver coupled to the digital network for receiving the combined reverse optical ~~digital RF~~ signals, and for converting the combined reverse optical ~~digital RF~~ signals to analog reverse optical ~~RF~~ signals; and

a headend coupled to the receiver for receiving and processing the analog reverse optical ~~RF~~ signals,

whereby, due to a burst-mode transmission from each of the plurality of reverse transmitters, the digital network combines the combined reverse optical ~~digital RF~~ signals from the plurality of reverse transmitters using header identifier information.

4. (Currently Amended) The communications system ~~transmitter~~ of claim 3, wherein the ~~broadband~~ communications system is a cable television system that may include both a digital headend and an analog headend for generating and receiving the combined reverse optical signals in both the digital and the analog formats ~~digital RF signals and the analog RF signals~~.

5. (Currently Amended) The communications system ~~transmitter~~ of claim 4, wherein the ~~broadband~~ communications system further includes:

a descriminator circuit coupled to the digital network for analyzing the header identifier information,

wherein dependent upon the header identifier information, the descriminator circuit provides the combined reverse optical ~~digital RF~~ signals in the digital format to the digital headend and provides the combined reverse optical ~~analog RF~~ signals in the analog format to the analog headend.

6. (Currently Amended) A communications system for transmitting and receiving optical signals over a communications medium, the communications system comprising:

subscriber equipment for transmitting reverse optical signals;

a plurality of transmitters coupled to at least one of the subscriber equipment for digitizing the reverse optical signals, wherein each of the plurality of transmitters comprising:

a carrier-detect circuit for detecting when reverse optical signals are present within the transmitter;

a delay circuit for delaying the reverse optical signals; and

a switch coupled to the delay circuit and controlled by the carrier-detect circuit,

wherein when the carrier-detect circuit detects a reverse optical signal~~s~~, the carrier-detect circuit allows the reverse optical signal~~s~~ to be transmitted upstream through the digital network;

a digital network coupled to each of the plurality of transmitters for combining the digital reverse optical signals, wherein the combined digital reverse optical signal has a single wavelength;

a receiver coupled to the digital network for converting the digital optical signals back to the original reverse optical signals; and

a headend coupled to the receiver for processing the reverse optical signals,

wherein each of the transmitters combines the reverse optical signals received from the subscriber equipment into a combined reverse optical signal. ~~whereby the communications system~~

~~combines the reverse signals from each of the plurality of transmitters within the digital network and delivers the reverse signals to the receiver~~.

7. (Canceled)

8. (Currently Amended) The communications system of claim 6, wherein digitizing the reverse optical signals is accomplished with an analog-to-digital converter.

9. (Currently Amended) The communications system of claim 6, wherein each of the plurality of transmitters blocks the reverse optical signals and encapsulates the blocks into packets with associated identifier header information for identification within the headend.

10. (Original) The communications system of claim 9, wherein the communications system is a cable television system that may include both a digital headend and an analog headend.

11. (Original) The communications system of claim 10, wherein the communications system further comprises:

a descriminator circuit coupled to the digital network for analyzing the associated identifier header information,

wherein dependent upon the identifier header information, the descriminator circuit provides the packets to one of the digital headend and the analog headend.

12. (Original) The communications system of claim 6, wherein the communications medium is a hybrid fiber coaxial cable.

13. (Original) The communications system of claim 10, wherein a control system is used in connection with both the digital and the analog headends for preventing collision of the reverse signals.

REMARKS

Claims 1, 3-6, and 8-13 are presently pending in the application. Claims 1, 3, 6, 8-9, and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts (6,418,558). Claims 4-5, 10-11, and 13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts and Dail (5,765,097) in view of LaJoie (5,850,218).

Applicants have amended independent claims 1 and 6 to make clearer the present invention. The present invention is directed towards a burst-mode digital transmitter that allows a *combined reverse, or upstream,* optical signal, which comprises a plurality of reverse optical signals, to be transmitted to the headend, *where the combined reverse optical signal has a single wavelength.*

Conversely, prior to the present invention, reverse optical signals could not be combined onto the same media *without* manipulation, *or frequency-shifting,* of the signals. By way of example, as taught in Roberts (6,418,558, col. 27, 14-30), in order to transmit optical signals in the upstream direction, set-top box information is received *and frequency shifted as shown in FIG. 118.* Then, the upstream from one coaxial leg is then combined with additional coaxial legs where the reverse signals have been frequency shifted to a unique wave. Additionally, col. 49, lines 43-46 state 'since the downstream signal constitutes a point-to-multipoint node topology, the OFDM wavelength arrives via a single path in an inherently synchronous manner, *in contrast to the upstream signal.* In other words, in the downstream application of transmitting signals, where the signals are generated at a point and transmitted to multiple points, the optical signals can be transmitted in a single wavelength. Therefore, as *implied* in col. 49, lines 43-46, the upstream transmission of optical signals generated from multiple points and transmitted to a single point requires multiple wavelengths. This is in direct conflict with independent claims 1 and 6, as amended.

The Examiner also states that 'digitizing the *reverse* analog optical signals is met by the operation of the A/D converter 332, which receives RF modulated signals and converts them to digital, col. 49, lines 41-65.' After review of this section, it is unclear how this teaches digitizing the analog signals. Generally, this section alludes to the *downstream* optical signals and a method of using the amplitude, frequency, and timing of the downstream signal to detect the information. Regardless, due to the difference of transmitting downstream signals versus upstream signals (i.e., point-to-multipoint versus multipoint-to-point), any manipulation of signals in the downstream does not correlate to any manipulation of signals in the upstream.

Additionally, the present invention only transmits reverse signals with the presence of a carrier signal, in other words this is known as "burst-mode" transmission. Only transmitting reverse signals with the presence of a carrier is advantageous to a communications system because there is no longer a

requirement for a one-to-one correlation between a transmitter and receiver. More specifically, there may be several reverse transmitters that are combined and received by one receiver. Furthermore, the ingress or noise that is introduced with transmitted signals is greatly diminished in the system.

In prior art as well as the teachings of Roberts, reverse transmitters transmit at all times regardless of whether or not a carrier is present. Specifically, there is no teaching in Roberts of transmitting reverse signals only with the presence of a carrier signal. The teaching of Roberts, both inherently and implied, is directed towards the modems transmitting signals at all times regardless of the presence of a carrier signal. Consequently, reverse signals as well as noise signals are continuously being transmitted. Additionally, it is respectfully submitted that the claimed burst-mode transmission (i.e., transmitting reverse signals only in the presence of a carrier signal) is not equivalent to Robert's combiner 408, which combines the upstream signals to be sent to the headend. There is no implication that the combiner 408 combines selective signals or signals only in the presence of a carrier signal. Furthermore, the additional components (delay circuit and switch) of the present invention are simply used in order to ensure that when a carrier signal is detected, the reverse signal is sent in its entirety without a first portion of the reverse signal being prevented from transmission. It is respectfully submitted, therefore, that either alone or in combination with Dail, Roberts does not teach or imply the reverse transmitter of the present invention.

In light of the remarks, it is believed, therefore, that claims 1 and 6 are allowable over the cited art. Additionally, the dependent claims 3-5 and 8-13 are also patentable over the cited art. Reconsideration and reexamination of the present application is requested in view of the foregoing amendment and in view of the remarks.

CONCLUSION

The foregoing is submitted as a full and complete response to the Final Office Action dated December 15, 2005. Claims 1, 3-6, and 8-13 will be pending in the present application upon entry of the present amendment, with claims 1and 6 being independent. Based on the amendments and remarks set forth herein, Applicant respectfully submits that the subject patent application is in condition for allowance. Because the claims may include additional elements that are not taught or suggested by the cited art, the preceding arguments in favor of patentability are advanced without prejudice to other bases of patentability.

Upon entry of the foregoing Response, the above-identified patent application includes 2 independent claims. Because Applicant has previously paid for 20 total claims and 3 independent claims, Applicant submits that no additional fee is due. Should it be determined that any additional fee is due or any excess fee has been received, the Commissioner is hereby authorized to charge any fees which may be required or credit any overpayment to deposit account #19-0761.

Should the Examiner have any comments or suggestions that would place the subject patent application in better condition for allowance, he is respectfully requested to telephone the undersigned agent at the below-listed number.

Respectfully submitted:

SEND CORRESPONDENCE TO:

By: [signature]
WM. BROOK LAFFERTY

Date: 21 Feb '06

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